AU/ACSC/020/2001-04

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

MEETING THE JOINT VISION 2020 CHALLENGE:

ORGANIZING FOR INFORMATION OPERATIONS

by

John D. Bansemer, Major, USAF

A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

Advisor: Lt Col Kimberly Sievers

Maxwell Air Force Base, Alabama

April 2001

Report Documentation Page

Report Date	Report Type	Dates Covered (from... to)
01APR2001	N/A	-

Title and Subtitle	**Contract Number**
Meeting the Joint Vision 2020 Challenge: Organizing for Information Operations	
	Grant Number
	Program Element Number

Author(s)	**Project Number**
Bansemer, John D.	
	Task Number
	Work Unit Number

Performing Organization Name(s) and Address(es)	**Performing Organization Report Number**
Air Command and Staff College Air University Maxwell AFB, AL	

Sponsoring/Monitoring Agency Name(s) and Address(es)	**Sponsor/Monitor's Acronym(s)**
	Sponsor/Monitor's Report Number(s)

Distribution/Availability Statement
Approved for public release, distribution unlimited

Supplementary Notes

Abstract

Subject Terms

Report Classification	**Classification of this page**
unclassified	unclassified

Classification of Abstract	**Limitation of Abstract**
unclassified	UU

Number of Pages
53

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Preface

Today, the nature of information operations (IO) and its overall impact on future conflict continues to be vigorously debated. Often missing from this debate are objective assessments of the information domain, the overall effectiveness of IO capabilities, and the potential implications of significant organizational changes. As other authors writing on the IO subject have shown, there are obvious parallels between the evolution of airpower during the interwar years and IO today. I have attempted to extend their work by examining both the American and British experiences. Instead of applying the analogy to a subset of IO capabilities, I have explored the likely impact across the entire IO spectrum. Finally, I have also explored how space advocates have also struggled with similar organizational issues. The ultimate objective of my research was to provide an unbiased framework with which to assess both the degree of autonomy to grant IO organizations along with the potential effects of such autonomy.

AU/ACSC/020/2001-04

Abstract

Joint Vision 2020 recognizes the increasing importance of operations within the information domain as well as the need to have appropriately designed organizations prepared to support and conduct operations within the information domain. This paper provides an initial framework to assess organizational structures for IO using the evolution of British and American airpower organizations during the interwar years. This analysis will show how, over time, the debate over organizing air forces became centered on a core set of criteria. Applying these criteria to IO will provide a preliminary determination of the degree of organizational autonomy warranted for IO. In a similar manner, the organizational decisions made during the interwar years had direct implications on both airpower and service organizations. These implications will be assessed against three organizational constructs: an independent IO service, semi-autonomous service organizations, and a joint unified command. This analysis will illustrate that an independent service is not warranted at this time; however, it does point to a requirement to grant greater autonomy to IO organizations within the services to help foster operational and doctrinal innovation. Finally, a pre-existing joint unified command should assume control of all IO capabilities to ensure the proper integration of the many disparate capabilities grouped under the IO rubric.

Chapter 1

Introduction

Operations within the information domain will become as important as those conducted in the domains of sea, land, air, and space.

—Joint Vision 2020

As *Joint Vision 2020* suggests, the information domain represents the military's newest warfighting domain. However, because of its nascency, information operations (IO) organizations are continuing to be modified and refined throughout the services and department of defense.[1] While the current organizational fluctuations are reasonable to expect, creating optimal organizational structures will be a critical element in the successful employment of IO capabilities.

Organizing forces within a new domain is not a new phenomenon. Like IO, military leaders wrestled after WWI with how to organize forces within a new domain of operations—air. An analysis of the period suggests a variety of factors influence organizational decisions. Examining these factors, how leaders ultimately organized forces, and the implications of their decisions, can guide similar decisions for IO today. To aid in this effort, this paper will provide a historical analysis of some of the factors that influenced the evolution of airpower organizations to provide a baseline for future IO organizational decisions.

There are three important IO organizational constructs to consider: an independent service, semi-autonomous service organizations and joint organizations. As will be seen, the historical

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analysis of airpower has direct application to the question of establishing a completely independent service or unified command. Furthermore, the degree of autonomy to grant to IO organizations within the services is particularly important because it will directly affect the service's basic mission to organize, train, and equip forces. *Joint Vision 2020* recognizes this and challenges the services to consider organizational designs to best support the evolving IO mission area.[2] Similarly, joint organizations are central to the planning and execution of IO. This paper will provide preliminary recommendations for all three constructs.

Framework for Analysis

Currently there are several competing definitions for IO and information warfare creating confusion when analyzing the IO arena. To provide a single point of reference, this paper will rely on the joint definition of information operations, "actions taken to affect adversary information and information systems while defending one's own information and information systems."[3] Likewise, the analysis of IO capabilities will be drawn from the offensive and defensive capabilities outlined in joint doctrine.[4]

Using this definition as a backdrop, this paper will first examine the evolution of airpower organizations as a framework to assess organizational structures for IO.[5] The analysis in chapter two will illustrate how, over time, the airpower debate became centered on a core set of criteria. First, the criterion of a unique domain often serves as the original impetus for creating new organizations. Second, there is often a strong correlation between the perceived decisiveness of a force and the degree of autonomy granted to that force. Third, technical expertise and effective employment within a domain of operations often demand greater organizational autonomy. As airpower satisfied more of these criteria, additional autonomy was granted. Examining these criteria and how well IO satisfies them will aid in a preliminary determination of the degree of

organizational autonomy warranted for IO. Moreover, besides satisfying key criteria, organizational decisions should be made based upon their potential impact on other organizations as well as the likely effect on the newly established organization.

Using the airpower example again, the focus in chapter three will shift to an examination of some of the potential implications for organizational decisions. The purpose of this analysis is twofold. First, it provides lessons from past organizational experiences and thus serves as a backdrop for potential decision-makers. Second, the analysis further guides the selection of IO organizational structures that maximizes positive effects while minimizing negative ones. The potential implications will then be applied to the three organizational constructs discussed previously to determine the likely impact of these constructs on the employment of IO.

This paper will close in chapter four with a brief review of the historical framework and a summary of the organizational recommendations. In closing, this chapter will provide recommendations for future areas of research including an assessment of current organizational designs and suggested changes to joint doctrine. Taken in total, this research will establish an historical framework that can be used to objectively assess possible IO organizational decisions while providing insight into the potential implications of these decisions.

Notes

[1] See, "USSPACECOM Takes Charge of DoD Computer Network Defenses," Release number 19-99, 1 Oct 1999, n.p.; on-line, Internet, 15 Feb 01 http://www. spacecom.af.mil/ usspace/new19-99.htm.; "USSPACECOM Takes Charge of DoD Computer Network Attack," release number 15-00, 29 Sep 2000, n.p.; on-line, Internet, 15 Feb 01. http://www.spacecom.af.mil/usspace/rel15-00.htm.

[2] *Joint Vision 2020 - America's Military: Preparing for Tomorrow*, US Government Printing Office, Washington, D.C., June 2000, 28.

[3] Joint Publication 3-13, *Joint Doctrine for Information Operations*, 9 October 1998, I-9.

[4] Ibid, I-10. Offensive capabilities include OPSEC, military deception, PSYOP, EW physical attack, special information operations and computer network attack. Defensive capabilities include information assurance OPSEC, counterdeception, counterpropaganda, counterintelligence, and EW.

Notes

[5] This paper does not purport to be the first to examine the parallels between airpower organizations during the interwar years and IO. Both, Gregory J. Rattray, "Strategic Information Warfare: Challenges for the United States," (PhD diss., Fletcher School of Law and Diplomacy, 1998) and Richard M Jensen, *Information War Power: Lessons from Air Power* (Cambridge, Mass.: Program on Information Resources Policy, September 1997) have also explored this period. However, this paper expands this analogy to the British experience during the interwar years and also examines the current debate over organizing space forces to provide the necessary framework for analysis. Furthermore, both of the previous authors were focused on a narrower subset of IO—strategic information warfare and how it relates to the strategic bombing campaigns of WWII. This paper is focused on organizational implications for the entire set of IO capabilities.

Chapter 2

Organizing Forces in a New Domain: The Airpower Example

...it is hard to think of any other major method of warfare which, on one hand, aroused such passionate faith and, on the other, such vigorous scepticism.

—Noble Frankland[1]

Frankland was referring to the airpower debate raging in England just prior to the establishment of the Royal Air Force (RAF) in 1918. A review of the current discourse regarding IO would likely yield a similar observation. Some advocates passionately suggest IO will fundamentally alter the way wars are fought while others remain decidedly more skeptical as to its overall impact on future conflicts.[2] Today, IO is seen by many as a method to quickly achieve asymmetric victory, potentially eliminate casualties, and reduce collateral damage. This chapter will examine other parallels between the development of airpower and the ongoing maturation of IO. This examination will focus on criteria that motivated Air Force organizational decisions and apply these same criteria to IO in its present form. This analysis coupled with an examination of current space organizational issues will provide a framework for follow-on analysis of how best to organize IO.

Criteria for Organizational Independence

When operations within a domain become practical, a logical next step is to consider how to organize forces to operate in that domain. An initial reaction may be to grant some degree of

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organizational autonomy or even independence to forces conducting operations within the domain. As the American experience with airpower illustrated, such autonomy can take many forms ranging from establishing integrated and subordinate organizations, to a separate corps, or even an independent service or department.[3] The central question then becomes the degree of autonomy to grant. In the absence of a tangible threat to national security, the answer to this question often revolves around a core set of criteria.[4]

Examining the evolution of American airpower suggests that three criteria were at the center of the organizational debate. First, the domain should be distinct and exploitable in relation to other operational realms (unique domain). Second, forces organized within a domain should be able to achieve decisive results in battle (decisive). Third, effective employment of capabilities within a domain requires an independent organization (effective employment). Intrinsically related to the third criterion is the belief that an organization must be manned and led by specialists who understand the inherent capabilities provided by the medium—a concept this paper will term domain-mindedness.[5] All of these criteria were prevalent as airpower evolved during the interwar years.

Unique Domain

The first criterion requires a unique and exploitable domain. Unfortunately, there is no DoD definition for domain. Resorting to the dictionary yields the definitions, "a territory over which rule or control is exercised" and "a sphere of activity, concern, or function."[6] When focusing on information, the concept of territory is less helpful than the second definition concerning a sphere of activity (which will be used for this paper). Other synonyms include dimension, realm, and area. The key element within this definition is that a domain should have defined boundaries

and characteristics to delineate one domain from another. These boundaries then create the necessary distinctions to justify a "unique" domain.

Early airpower advocates argued that the air domain was unique in comparison with those of land and sea because it allowed three-dimensional movement, speed, and the ability to avoid surface forces altogether. Freedom of action was a critical distinguishing characteristic for the domain as it described the airplane's ability to pass over "fortified lines of defenses without first breaking through them."[7] Because airpower could strike directly at a country without the restrictions of first defeating or evading enemy defenses, freedom of action strengthened the argument for independence because it represented the uniqueness of the air domain.

Secondly, the domain was now exploitable to a much greater extent than had ever been possible. Although the air domain had long been used (e.g., artillery and observation balloons), the airplane greatly expanded the utility of the sky.[8] Guilio Douhet, the Italian airpower theorist, recognized early on how the "speed and freedom of action of the airplane" provided a revolutionary warfighting capability.[9] Such thinking was later articulated at the Air Corps Tactical School by Captain Robert Webster, "Air power is not a new weapon—it constitutes a new force, as separate from land power and sea power as each is separate from the other."[10]

For IO, the question of a unique domain appears to be settled. A variety of documents including *Joint Vision 2020* have made a de facto declaration of a new domain for military operations—the domain of information. For example, the Air Force's seminal IW paper, "Cornerstones of Information Warfare," specifically addressed the information domain, acknowledging that although the domain of information has existed for centuries, the advent of the information age has made military operations practical within the domain.[11] Former Air Force chief of staff, General Ronald Fogleman, also referred to information operations as the

"fifth dimension of warfare" besides land, sea, air, and space.[12] A more detailed analysis of the domain supports the general conclusions above—the information domain is in fact unique.

Adapting methodologies used in two recent studies on air and space power provides three distinguishing features to frame the analysis of the IO domain: physical environment, target sets, and operational characteristics of IO capabilities.[13] First, although various IO capabilities use the traditional domains of air, sea and land for effect, IO relies on the electromagnetic spectrum to a much greater degree than other warfighting capabilities.[14] Second, the unique target sets within the IO domain include information- and cognitive-based targets that are quite distinguishable from those selected in other domains. As joint doctrine states, "IO targets information or information systems in order to affect the information-based process."[15]

Finally, a variety of operational characteristics such as non-lethality/limited physical destruction, speed of attack, and stand-off capability further distinguishes IO from traditional military operations. For example, IO capabilities offer the unique opportunity to achieve objectives "while minimizing potentially devastating social, economic, and political effects normally associated with conventional military operations."[16] The speed of IO attack can range from months for a strategic deception operation to operations conducted at rates approaching the speed of light. In the latter instance, attacks relying on the EM spectrum are governed primarily by the physical properties of conducting mediums (e.g., air, fiber optics, etc.) and these impose minimal delays on IO attacks.

Another unique operational characteristic is the ability to create effects from significantly remote distances (i.e., outside a theater of operations) for sustained periods of time against a wide variety of targets. However, with the possible exception of long-range missiles, the application of force presently requires the presence of platforms within a theater of operations.

IO breaks this paradigm by allowing operations to be conducted remotely and completely outside the physical battlespace (albeit with legal considerations that are outside the scope of this paper).[17] The point of the preceeding description is not to provide absolute boundaries on the information domain but to illustrate that the domain is fundamentally distinct from other operating domains. Furthermore, in addition to being distinct, the domain is now exploitable.

Like the air domain after the invention of the airplane, the IO domain has recently become much more open to exploitation. The advent of the microprocessor coupled with increasingly networked infrastructures has created a new avenue for information-based operations as well as providing new methods to apply the more traditional capabilities of deception and PSYOP. Some IO capabilities such as deception and PSYOP have been part of war for thousands of years; however, the increased reliance on information by decision-makers coupled with tools to better exploit the information environment has correspondingly increased the utility of operations within the information domain. *Joint Vision 2020* recognizes this stating,

> "While activities and capabilities employed to conduct information operations are traditional functions of military forces, the pace of change in the information environment dictates that we expand this view and explore broader information operations strategies and concepts."[18]

In short, increased reliance on information and information systems has made operations within the information domain much more feasible and increased their ability to qualitatively affect the outcome in conflict.

Decisiveness

Central to the question of decisiveness is how the term is applied. For some, the nature of decisiveness can require a particular force to "win wars independently from all other arms."[19] A more widely recognized definition only requires the force be "predominant in achieving the desired goal."[20] This paper will use the latter definition. Unfortunately, the subjective nature of

the term "decisive" ensures that the question of what force is and is not decisive will continue to be debated.[21] The concept of decisiveness remains an important yardstick today, particularly when trying to determine the degree of autonomy to grant forces possessing unique operational capabilities. When examining previous organizational decisions, there is often a direct correlation between the degree of autonomy granted and the perceived ability to be decisive in conflict.

After WWI, traditionalists argued that airpower could not be decisive. Specifically, airpower was "unable to occupy territory, it was dependent on fixed bases, and it was unable to conduct continuous and sustained operations."[22] An Air Force historical study of the period summarized the findings of one of the first boards to study airpower after WWI stating, "independent air action could not prove decisive against ground forces."[23] In a similar vein, the same study summarized the Dickman Board findings stating, "nothing in the war … indicated that air activities could be conducted independently of ground troops so as to affect materially the outcome of the struggle."[24]

As a counterpoint to this argument, air enthusiasts argued that airpower did not have the opportunity to prove itself during the recently complete war (i.e., WWI). Instead air advocates proposed that airpower constituted a separate force "whose power and destruction would perhaps be the decisive factor in the outcome of future wars."[25] In other words, the airpower advocates were relying on the potential to achieve decision rather than demonstrated results.

Like airpower after WWI, IO has enormous unproven potential and thus, rests more on theory and speculation. Currently, there is no hard, objective data to suggest that IO can achieve decisive results independently. Thus, the debate on whether IO represents, in the words of vice chairman of the Joint Chiefs of Staff Gen Richard Myers, "another arrow in the quiver" or a

potentially decisive force in its own right is likely to continue.[26] As IO matures and its potential

to affect the outcome of conflicts is better understood, leaders will be able to better determine the

degree of autonomy warranted. In other words, there should be some congruency between

decisiveness and organizational autonomy.

Effective Employment

The third and final criterion centered on what was the best organizational construct to

effectively employ airpower. Airpower advocates felt that relegating airpower to the control of

the Army or Navy inhibited the freedom of action necessary for the effective employment of

airpower. The logic of this argument centered on the belief that the traditional services would

relegate airpower to auxiliary support roles. General "Billy" Mitchell argued that the segregation

of air units among Army corps and divisions would make it difficult to achieve the necessary

mass required for the independent mission he envisioned.[27] In other words, "the air weapon

could be decisive only if it operated outside the tactical restrictions imposed by surface

commanders."[28] Such thinking has evolved to the a fundamental belief of airmen within the

USAF that "coordination *(of air power)* …is, however, best achieved by vesting a single

commander with the authority to direct all force employment in pursuit of a common

objective."[29] Closely connected to this concept was the belief in domain-mindedness.

Domain-mindedness focuses on the need for trained specialists within a given domain. This

concept represents a common theme in virtually all struggles to gain organizational autonomy.

Airmen who spent their careers learning the capabilities and limitations of their platforms could

make a just claim that they were in the best position to make decisions regarding the effective

employment of airpower. Such a claim is evidenced in today's air doctrine which states, "airmen

best understand the entire range of air and space power." However, to create domain-

mindedness requires the proper organizational structure and focused training. As one examination of the interwar period stated, "the development of technological expertise within the Army air arm during the period clearly followed the impetus created by doctrine and the organizational leadership."[30] Such a requirement has definite implications for IO.

Quite simply, experts within a unique domain of operations should lead forces operating within the domain because of the technical expertise required to operate effectively within the environment. For IO this means information operators should lead IO organizations. The skills associated with IO cannot be taught quickly—advanced degrees and specialized courses are necessary to appropriately train personnel operating with the domain. Furthermore, attempting to integrate seemingly disparate functions (e.g., PSYOP, EW, and CNA) into a cohesive force requires a sound understanding of the unique capabilities and limits of each discipline. Thus, some degree of organizational autonomy is necessary to foster "domain-mindedness" required for effective operations. The degree of autonomy necessary and the proper organizational construct for effective employment is a question for the next chapter.

Summary

The historical analysis sets the stage for further analysis of IO organizations. Arguments for air independence centered on the three criteria of a unique domain, decisiveness, and effective employment. The air advocates focused their arguments on the unique medium of air, the ability to avoid contact with surface forces, and the concern that subordination of airpower to surface forces would unnecessarily constrain the use of this new force. Arguments against independence centered on the perceived inability of airpower to be decisive and a fundamental disagreement as to its proper employment. Ultimately, American proponents for airpower satisfied all three criteria and a separate service was created.

Given the three criteria where does IO stand in comparison with the air domain? First, as shown, the information domain is separate and distinct. Second, at this time there is no objective evidence that IO could be predominant in achieving the desired end objectives in a significant conflict. Third, IO may require some form of organizational autonomy to foster domain-mindedness and doctrinal innovation, an issue that will be discussed further in the next chapter. The table below summarizes these findings.

Table 1: Comparison of Air and Information Domains

Criteria	Air	Information
Unique Domain	Yes	Yes
Effective Employment/ Domain-mindedness	Yes	Partially
Decisiveness	Yes	Unproven

Notes

[1] Noble Frankland, *The Bombing Offensive Against Germany* (London, England: Faber & Faber, 1965): 36.

[2] Two articles that argue IW/IO will fundamentally alter future warfare are: Don Staufer, "Electronic Warfare: Battles Without Bloodshed," *Futurist* 34, no 1 (Jan/Feb 2000): 23; and Col Carla D. Bass, "Building Castles on Sand – Underestimating the Tide of Information Operations," *Airpower Journal* 13, no. 2 (Summer 1999): 27-45; Taking a more skeptical view to the overall potential of IW/IO are George Smith, "An Electronic Pearl Harbor? Not Likely," *Issues in Science and Technology* 15, no 1 (Fall 1998): 68-73; and Martin C. Libicki, "Rethinking War: The Mouse's New Roar?" *Foreign Policy* no 117 (Winter 1999-2000): 30-43.

[3] Space Commission, 80. The recently completed Space Commission report recognizes a department "as the traditional approach to creating a military organization with responsibility to organize, train, and equip forces for operations in a defined medium of activity."

[4] Frankland, 30. As Frankland discusses, a key part of the decision to create an independent British air force resulted in large part from the enormous psychological impact of German Gotha bombers on London in 1917. In the British case, a longer debate was lacking because of the perceived need to immediately address the German bombing threat.

[5] Maj Shawn, P. Rife, "On Space-Power Separatism," *Airpower Journal* 13, no. 1 (Spring 1999): 25. These criteria are based in part on Maj Rife's study of space power. Maj Rife based the independence decision on two hypotheses. First, independence should only be granted when unique expertise was not fostered within existing organizational structures (what this paper calls domain-mindedness); and, second, only an independent force "can provide a capability that is considered vital to our national defense" (a combination of effective employment and decisiveness).

[6] *American Heritage Dictionary*, Second College Edition, 1985.

Notes

[7] Giulio Douhet, *The Command of the Air,* trans. Dino Ferrari (1942; new imprint, Washington, D.C.: Office of Air Force History, 1983), 9.

[8] Richard M. Jensen, *Information War Power: Lessons from Air Power* (Cambridge, Mass.: Program on Information Resources Policy, September 1997), 22.

[9] Douhet, 3-4.

[10] Lt Col Peter R. Faber, "Interwar US Army Aviation and the Air Corps Tactical School: Incubators of American Airpower," in *The Paths of Heaven: The Evolution of Airpower Theory*, ed. Col Phillip S. Meilinger (Maxwell AFB, Ala.: Air University Press, 1997), 183.

[11] *Cornerstones of Information Warfare*, Washington D.C., Headquarters, Department of the Air Force, 1996, 8-9.

[12] Gen. Ronald R. Fogleman, chief of staff, US Air Force, address to the Armed Forces Communications-Electronics Association, Washington, April 25, 1995, n.p.; on-line, Internet, 5 January 2001, available from http://www.defenselink.mil/ speeches/1995/dil047.html.

[13] Major Bruce M. DeBlois, "Ascendant Realms: Characteristics of Airpower and Space Power," in *The Paths of Heaven: The Evolution of Airpower Theory*, ed. Col Phillip S. Meilinger (Maxwell AFB, Ala.: Air University Press, 1997), 534. Major Alan M. Robinson, "Distinguishing Space Power From Air Power: Implications For The Space Force Debate," Research Report no. 98-239 (Maxwell AFB, Ala.: Air Command and Staff College, April 1998), 23-29; on-line. Internet, 28 Jan 2000, available from http://www.maxwell.af.mil/au/database/research/ay1998/acsc/98-239.pdfRobinson. Of note, currently no definitive study of the information domain has been done. In addition, joint IO doctrine does little to define and bound the information domain besides listing the capabilities within IO. Appendix A of this paper addresses this deficiency to some extent and provides an initial framework from which to perform a more detailed analysis of the domain.

[14] Joint Publication 3-51, *Joint Doctrine for Electronic Warfare*, 7 April 2000, I-4. The joint publication references the reliance of both EW and information processes on the electromagnetic spectrum. Other capabilities rely on the traditional domains for effect. For example, PSYOP activities may rely on the Commando Solo airframe to conduct an operation. In such a situation, IO would rely more extensively on the air medium for the conduct of operations.

[15] Joint Publication 3-13, *Joint Doctrine for Information Operations*, 9 October 1998, I-11.

[16] Ibid, I-10.

[17] Ibid, II-9.

[18] *Joint Vision 2020 - America's Military: Preparing for Tomorrow*, US Government Printing Office, Washington, D.C., June 2000, 28.

[19] Col Phillip S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell AFB, Ala.: Air University Press, 1997), 19.

[20] Ibid, 19.

[21] Capt Frederick L. Baier, *50 Questions Every Airman Can Answer* (Air Force Doctrine Center, Maxwell AFB, Ala. Air University Press, October 1999), 78-79. Baier provides an excellent discussion of the decisive and argues that what really matters is if the joint force wins. Unfortunately, decision will continue to be a measure of merit of service contributions to the joint effort.

[22] Faber, 207.

Notes

23 Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm: 1917-1941*. (1955; reprint, Washington, D.C.: The United States Air Force Special Studies Government Printing Office, 1985), 21.

24 Ibid, 25.

25 Faber, 183.

26 "Military Prepares Info-War Tactics," *Electronic Engineering Times*, 10 January 2000, 8.

27 Lt Col Mark A. Clodfelter, "Molding Airpower Convictions: Development and Legacy of William Mitchell's Strategic Thinking," in *The Paths of Heaven: The Evolution of Airpower Theory*, ed. Col Phillip S. Meilinger (Maxwell AFB, Ala.: Air University Press, 1997), 100.

28 Faber, 206.

29 Air Force Doctrine Document 1, *Air Force Basic Doctrine*, September 1997, 12.

30 Gregory J. Rattray, "Strategic Information Warfare: Challenges for the United States," (PhD diss., Fletcher School of Law and Diplomacy, 1998), 381.

Chapter 3

Organizing Information Operations Forces

Information operations may evolve into a separate mission area requiring the Services to maintain appropriately designed organizations and trained specialists.

—Joint Vision 2020

What *Joint Vision 2020* fails to specify is the other side of the mission/organization coin; namely, that today's organizational decisions will play a major role in how IO evolves within the defense department. Just as the evolution of airpower doctrine was inextricably linked to organizations, the dual forces of doctrine and organizations will drive the evolution of IO. Instead of waiting for IO to evolve into some as yet undetermined form, the question of organizational design must be addressed now to facilitate effective doctrine development and successful employment of IO.

Organizational Structures and Associated Impacts

The purpose of this chapter is to examine organizational structures and their potential implications on the future employment of IO. Specifically, this chapter will analyze the possible effects of organizational decisions on three constructs: a completely independent service for IO, semi-autonomous IO organizations within the services (specifically the Air Force), and the placement of IO under a new or existing unified command. Three major implications of

airpower organizational decisions during the interwar period will be used to fame this analysis: the impact on services in the performance of their assigned missions (interservice effects), the doctrinal effects resulting from organizational decisions, and bureaucratic realities affecting a chosen organizational construct. Following the examination of the interwar period, these implications will be used to examine the potential effects of IO organizational decisions.

Interservice Effects

Organizational changes greatly impact the services and should not be considered in a vacuum. For example, the development of an independent American air force did not obviate the need for the other services to continue to develop indigenous airpower capabilities uniquely suited to their respective operational environments (land and sea). Another consideration is the potential for IO innovation to occur within the services as a result of interservice rivalry and a desire of the services to maintain management over these functions. This is exactly what occurred in the US during the interwar years.

Naval aviators with the support of the larger US Navy were intent on not being transferred to an independent air arm. Soon after WWI, they began to explore the implications of aircraft carriers.[1] Navy competition with Army air advocates sparked innovation through the development of service-unique air capabilities in an attempt to avoid a repeat of the British experience of centralizing control of all aviation assets and personnel. In the span of only three years (1925-1927), naval innovations included movable deck carriers, an intensive study of aircraft tactics including dive bombing, and recommendations for high speed carriers.[2] The British took a different approach.

Subsuming all of the capabilities within a domain under a single organization can have a devastating impact on other services needing at least auxiliary support. The creation of the RAF

resulted in the loss of 60,000 aviation experts by the Navy.[3] The loss of an airpower advocate within the Navy resulted in little effort to fund naval aviation requirements.[4] The outcome of this decision was a decidedly less innovative approach to naval aviation than experienced in the United States. Ultimately, the centralized organizational structure proved untenable and the problem was finally resolved with the transfer of naval aviation assets and personnel back to the Navy in 1937.

Effects on Doctrine

The second implication resulting from changes in organization is that of effects on doctrine. In any new area of warfare, doctrine should be developed that supports the most effective application of force within the associated domain. However, the reality of the doctrine development process suggests that other factors, including organizational designs, will influence doctrine development. Just as doctrine can drive organizational designs, newly established organizations may develop doctrine that supports the organization's continued existence. The development of airpower doctrine provides clear evidence of the symbiotic relationship between doctrine and organizations.

The American case specifically illustrates how desired organizational constructs can drive doctrine. The extent to which doctrine was developed to support preconceived air force organizational constructs is still debated today. On the one hand is the belief that airpower theory was developed solely to support the creation of an independent air force.[5] As one study of the period stated, "the logic of autonomy demanded there be an independent mission for the air force."[6] While there is certainly merit to this argument, other reasons for embracing this doctrine also existed. Clearly, all military professionals at the time wanted to avoid a repeat of trench warfare. Advocates argued airpower could do this and, in Mitchell's words, achieve "a

victory that was quicker, cheaper and hence more humane."[7] The full extent that organizational desires influenced American airpower doctrine development may never be known; however, there appears to be growing acceptance that these desires played a meaningful role in doctrine development.[8] The British experience illustrates how doctrine can be driven by the perpetuation of an existing organizational construct.

When organizations are formed prior to the development of a somewhat mature doctrine, those organizations may then develop a doctrine to support their continued existence. In the British case, the RAF was forced to develop and later refine a strategic bombing doctrine in order to avoid being subsumed by the older and more powerful army and navy organizations. As Noble Frankland said of RAF Chief of Staff Hugh Trenchard, "his case turned upon the theory of a strategic air offensive, for without it there was no convincing case for the preservation of a separate air service."[9] The lesson remains that premature organizational decisions can consciously or unconsciously affect the development and advocacy of doctrine to support perceived organizational exigencies. To avoid this trap, an organization must consciously be aware of this potential pitfall and instead develop doctrine that articulates the most effective employment of power within a given domain. By following such a course, doctrine will then drive organizations rather than vice versa. Besides the doctrinal effects, leaders must be aware of the potential bureaucratic effects likely to occur as the result of organizational decisions.

Bureaucratic Realities

Newly created organizations will always struggle to gain legitimacy and power from more entrenched organizations. In fact, most new organizations are created from bits and pieces of existing organizations thereby creating an initial source of internal friction. Furthermore depending upon its size and level within the larger organizational hierarchy, the newly created

organization may have to fight to garner scarce fiscal and personnel resources. In the American and British case, the effects of fiscal constraints and bureaucratic infighting were manifested differently.

The American approach to airpower organization was evolutionary beginning with the establishment of the Army Air Service in 1920, the Army Air Corps in 1926, the Army Air Forces in 1941 to its present day form as the U.S. Air Force in 1947. Such an approach had both positive and negative consequences. On the plus side, while subordinate to the Army, American airmen did not have to fight budgetary battles with the other services. On the negative side, Army aviators were reliant on the stewardship of the Army General Staff that was populated primarily by ground officers. In actuality, the Army as an institution provided substantial support, and the Air Corps budgetary share in relation to the War Department total budget actually grew every year except one from 1925-39.[10] This support coupled with legislative efforts created ever increasing autonomy for airmen within the Army while shielding them from the more negative effects of complete independence experienced by the RAF.

The British example illustrates that despite good intentions early organizational independence can actually work to the detriment of the organization as it fights to survive. For example, the RAF had to devote significant resources in fighting bureaucratic battles with the well-established Admiralty and War Offices.[11] This forced the RAF to focus on subsidiary missions such as air-control operations rather than the development of doctrine and an effective fighting force.[12] Therefore, creating an independent service, particularly in austere budgetary environments such as the one facing the British after WWI, must be approached cautiously due to these unintended consequences. As leaders develop IO organizational constructs they should

keep these considerations as well as interservice and doctrinal ones at the forefront in the decision-making process.

Organizational Recommendations

Having considered the impacts from previous organizational decisions, there are several insights from the above analysis that are worth summarizing. First, the creation of a new organization within a domain does not eliminate the requirement to support sister services. Second, the development of capabilities within a new domain of operations can benefit greatly from interservice competition. Third, a premature predilection towards a particular organizational construct may result in the creation of a doctrine to support the desired construct rather than doctrine driving the design of organizations. In other words, organizations must be cognizant of the potential for organizational bias to negatively influence doctrine development. Finally, new organizations may face an uphill battle to garner the funds and personnel necessary to operate effectively. Given these insights, we can now examine IO organizational constructs.

Independent Service for IO

The general acceptance of a new operating domain does not, in and of itself, create a concomitant requirement to form an independent force as occurred with the Air Force. An independent service for IO is not yet justified for a variety of reasons. First, as shown in chapter two, IO has not yet proven to be decisive nor has its independence been shown to be a necessary prerequisite for effective employment of IO capabilities. The eventual establishment of an independent organization should occur when IO satisfies more completely the criteria outlined in chapter two and when the advantages of transferring IO functions to an independent organization outweigh the benefit of individual service retention of these capabilities. In addition, there are

issues related to the potential impact on other services requiring IO support, the impact on doctrinal innovation, and the significant bureaucratic barriers to the establishment of another independent service. Before examining these issues in detail, the perceived decisiveness of IO deserves a closer look because of parallels with space operations.

The inability of space to be decisive is one of the primary arguments against complete space organizational independence. Martin Faga, previous Assistant Secretary of the Air Force for Space, compared the creation of the U.S. Air Force with the creation of a U.S. Space Force stating, "An important difference is that the Air Force was a fighting force right from the start, whereas a new Space Force would not be, at least not for the foreseeable future."[13] A separate study stated, "without a viable space-to-surface force-application capability, space power (independent or otherwise) cannot be decisive in warfare except under the broadest possible interpretation."[14]

The importance of the space example is that it provides an important benchmark when considering organizational options for IO. Although space forces are not organized within a separate service, they have been granted some degree of organizational autonomy through the establishment of a functional unified command, USSPACECOM. The utility of such a construct will be examined in more detail in the discussion on joint organizations.

A second argument against an independent IO service is that a premature decision to create an independent service could have a detrimental impact on other services requiring IO support. Because of this impact, any decision to create an IO service should follow an evolutionary approach in which the services retain various IO capabilities uniquely suited to the accomplishment of their core competencies. The alternative centralized approach would likely have significant, negative effects on the services and should be approached with caution.

Third, complete independence is not required to successfully develop IO doctrine; however, some degree of organizational autonomy is required to create the environment necessary for doctrinal and operational innovation. The recently completed Space Commission echoed this theme in its report charging the proposed cadre of space professionals with developing, "new doctrine and concepts of operations for space."[15] However, the commission did not see a need for an independent service to facilitate the formation of such a cadre. Such a finding is equally applicable to IO—organizational autonomy is needed, but an independent service may not be. Until a separate service is warranted, the services should take the lead in the development of IO operational concepts while influencing the development of IO joint doctrine.

Finally, and most persuasive, bureaucratic realities raise perhaps the strongest arguments against a separate service for IO. Quite simply, IO does not possess the mass of personnel or equipment to justify an independent organization. Examining the issue of a separate space force, the recently completed Space Commission found several reasons to delay the creation of a separate service including the lack of "critical mass of qualified personnel, budget, requirements or missions sufficient to establish a new department."[16] Similarly, the creation of a separate IO service will only move the budgetary decisions up the DoD hierarchy forcing a newly established service to compete against its the well-entrenched service counterparts. In the RAF's case this proved detrimental to doctrine and tactics development. Such a system may work, but it could likely require significant congressional oversight to ensure the new force is allocated adequate resources. In short, numerous constraints, including bureaucratic ones, argue against complete independence at this time. Instead, the more appropriate choice may be to develop semi-autonomous organizations within the services that allow IO to mature.

Service Organizations

By allowing IO to incubate within the services, some of the more detrimental interservice effects associated with independent organizations can be avoided while fostering innovation between the services. For example, the Army Air Corps, after achieving some initial autonomy, was able to develop a theory of airpower quite divergent from the views shared by most of the Army's senior leadership. The creation of the Army Air Corps provided enough independence to foster innovation and encourage future developments of airpower. In a similar vein, creating semi-autonomous organizations within the services offers an excellent opportunity to develop IO expertise and capabilities while mitigating the negative effects associated with complete independence. As previously discussed, as IO matures, the question of complete independence and its associated benefits should be weighed against service benefits until the independent ones outweigh those of the services.

Embedded IO organizations within the services are uniquely positioned to effect positively the development and refinement of IO doctrine. As with an independent organization, service organizations must avoid the development of doctrine that perpetuates preconceived, service-oriented organizational constructs. Perhaps of even greater importance, the services should base their IO doctrinal foundations on objective data.

The need for objectivity is evident in an examination of US airpower doctrine development. American air advocates continued to rely on human intuition, "deductive reasoning, analogies, and metaphors" to develop their theory of airpower.[17] Their theory led to questionable assumptions on the vulnerability of bombers and caused most air advocates within the Air Corps to eschew the development of escort fighters. Although airmen from a variety of quarters raised questions as to the overall likelihood of success of the American theory of unescorted precision

bombing, these questions did not cause the larger Air Corps institution to develop rigorous testing or experimentation to confirm the assumptions inherent in the theory.[18]

To avoid a repeat of the American experience, data for doctrine development should be derived from experimentation in the lab, exercises in the field, and when the opportunity arises, through experiences on the battlefield. The data gained from these activities will provide the empirical evidence and basis for IO doctrine development. The services can also take a lesson from the RAF bureaucratic struggles for independence.

By continuing to foster IO within the services, the evolution of IO will benefit by avoiding RAF-like bureaucratic battles. Thus information operators can focus more directly on the development of doctrine and operational capabilities and not worry about defending their organizational existence. To be sure there will be critics who will charge the services with neglecting IO capabilities. However, as mentioned earlier, the services have often adequately supported new operational areas that support existing service capabilities. Avoiding these bureaucratic effects allows the services to take different approaches to organizing IO. In this respect, the Air Force approach to IO organization is compelling.

The Air Force recently reorganized IO forces under a numbered air force creating much of the organizational autonomy alluded to earlier.[19] As Gen Jumper, Air Combat Command commander stated, "it's an idea whose time has come. This integrates our information warfare skills and talents into the normal tactical and operational level of war just as we do fighters bomber and others."[20] What remains is for the Air Force to take the next step and create a completely independent numbered air force for IO. This will serve the purpose of granting greater autonomy while continuing to ensure the organization is responsive to the needs of the rest of the Air Force community.

An examination of Army and Navy IO organizations is beyond the scope of this paper. However, there is much merit to an examination of all service organizational constructs. For example, the Air Force takes a much broader view of IO and its associated capabilities.[21] The costs and benefits of the integration efforts of the Air Force should be weighed against other service organizational efforts. In this way, the services can determine best practices and potentially reduce redundant efforts. Joint organizations, the final organizational construct to be examined, can also assist with eliminating duplicative efforts.

Joint Organizations

While interservice rivalry can help spur innovation, there is a strong potential for duplication. This problem can be addressed with the creation of a joint organization to help guide the service efforts and avoid the development of redundant capabilities. The creation of an appropriately designed joint organization is less susceptible to the interservice effects mentioned above because the services would not lose their indigenous IO capabilities; instead, they would provide appropriate forces to the joint organization while retaining necessary organizations to train and equip IO forces.

In a similar vein, any joint organization assigned the IO mission area must carefully guard against manipulating doctrine to fit desired organizational goals. For example, much like the British case, a newly created IO unified command would have to guard against developing doctrine that supports the command's continued existence. Likewise, if IO is assigned to an existing unified command, the command should support doctrine that provides for the most effective execution of IO rather than supporting concepts that exist only to perpetuate organizational power and prestige. Closely related to questions of organizational influence is the need for an organizational construct that successfully integrates all IO capabilities.

Despite the implications of any organizational decision, a dedicated joint organization is needed to ensure the successful integration of the many disparate IO disciplines. This requires the creation of a permanent joint organization devoted to planning and executing IO. Such an organization needs to be appropriately designed to successfully integrate and exercise the various IO capabilities in peacetime to be prepared in times of crisis.[22] Currently, the IO cell is the only organization specifically addressed in joint doctrine.[23] Joint doctrine does charge joint force commanders with forming an IO cell to ensure successful integration of the various IO capabilities.[24] However, such a cell is not likely to be formed before a crisis and, thus, represents an ad hoc vice permanent organization making effective integration all the more difficult.

Adding to the confusion is the continued segregation of IO capabilities within different unified commands. Currently, the unified command plan designates PSYOP and Civil Affairs as "principal special operations missions" placing these missions under US Special Operations Command.[25] In addition, the unified command plan of 2000 gave US Space Command the additional mission of computer network attack to its computer network defense mission.[26] Such segregation contradicts the repeated calls for integration echoed throughout joint doctrine.

Bureaucratic realities are such that a new unified command for IO is unlikely given today's fiscal environment. However, additional consideration for such a command is required if IO develops into a separate mission area with proven decisive capabilities. Until that time, responsibility for IO will need to be assigned to an existing unified command. The key issue is ensuring IO is appropriately funded and resourced by the existing command in question. This would have the additional advantage of avoiding bureaucratic battles with the well-established unified commands. On the other hand, the development of IO would then rely on the stewardship and good will of its assigned command.

In her article on IO organizations, Col Carla Bass articulated two basic organizational choices: realign IO capabilities under an existing functional unified command or take the more drastic choice of creating a new functional unified command.[27] The first alternative is recommended as this paper has already detailed reasons for an evolutionary approach towards IO organizations. The remaining question is which unified command?

Prior research has already addressed the advantages and disadvantages of shifting complete responsibility to either USSPACECOM or USSOCOM.[28] However, this research was completed prior to the establishment of Joint Forces Command (USJFCOM). In light of USJFCOM's assigned role as the joint force integrator, a more thorough examination of the suitability of assigning USJFCOM the IO mission is prudent. A primary mission of USJFCOM is to serve "as the chief advocate for jointness and leaders of U.S. military transformation."[29] IO is at the forefront of this transformation and could be central to USJFCOM efforts. Furthermore, the emphasis on joint integration at USJFCOM is completely congruent with joint doctrine's repeated calls to integrate IO capabilities.

Regardless of the functional command chosen, a single unified functional command should be responsible for all IO capabilities thereby guaranteeing unity of effort in this important arena. The alternative is a further fracturing of the IO disciplines resulting in a fundamental break with current doctrine. Continued fracturing would necessitate a complete revision of current IO doctrinal thought and would be a step in the wrong direction. In addition, the split would hinder the development of "domain-mindedness," split IO expertise among several organizations, and inhibit integrated operations.

Summary

Having analyzed the potential implications of organizational decisions, complete organizational independence is not justified at this time. Instead the services should create semi-autonomous IO organizations while building and refining IO tactics, techniques, and procedures—an approach similar to the evolution of U.S. airpower. The services would then be well positioned to provide IO capabilities and appropriately designed warfighting organizations to an existing single unified command. Such a command could then oversee the integration of the IO capabilities and insure their synergistic application when called upon.

Notes

[1] Dr. David R. Mets, "The Influence of Aviation on the Evolution of American Naval Thought," In *The Paths of Heaven: The Evolution of Airpower Theory,* ed. Col Phillip S. Meilinger (Maxwell AFB, Ala.: Air University Press, 1997),120.

[2] Jan M. Van Tol, "Military Innovation and Carrier Aviation – The Relevant History," *Joint Forces Quarterly,* Summer 1997, 153. This artcile provides a thorough analysis of the impact of airpower on both British and American naval airpower.

[3] Ibid, 150.

[4] Ibid, 154.

[5] Richard M Jensen, *Information War Power: Lessons from Air Power* (Cambridge, Mass.: Program on Information Resources Policy, September 1997), 69.

[6] Ibid, 70.

[7] Lt Col Mark A. Clodfelter, "Molding Airpower Convictions: Development and Legacy of William Mitchell's Strategic Thinking," in *The Paths of Heaven: The Evolution of Airpower Theory*, ed. Col Phillip S. Meilinger (Maxwell AFB, Ala.: Air University Press, 1997), 90.

[8] Jensen, 69-70.

[9] Noble Frankland, *The Bombing Offensive Against Germany* (London, England: Faber & Faber, 1965): 34-35.

[10] Lt Col Peter R. Faber, "Interwar US Army Aviation and the Air Corps Tactical School: Incubators of American Airpower," in *The Paths of Heaven: The Evolution of Airpower Theory*, ed. Col Phillip S. Meilinger (Maxwell AFB, Ala.: Air University Press, 1997), 205.

[11] Scot Robertson "The Development of Royal Air Force Strategic Bombing Doctrine between the Wars: A Revolution in Military Affairs?" *Airpower Journal* 12, no. 1 (Spring 1998): 45.

[12] Ibid, 43.

[13] James W. Canan, "Conversations with Martin Faga," *Aerospace America,* March 2000, n.p.; on-line, Internet, 18 October 2000, available from http://www.mitre.org/news/articles_00/faga_aerospcam.shtml.

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[14] Maj Shawn, P. Rife, "On Space-Power Separatism," *Airpower Journal* 13, no. 1 (Spring 1999): 27.

[15] *Report of the Commission to Assess United States National Security Space Management and Organization*, (Washington D.C.: 11 Jan, 2001): viii.

[16] Ibid, 80.

[17] Faber, 218.

[18] Ibid, 222-223.

[19] "AIA Integrates into Air Combat Command," 2 February 2001, n.p.; on-line, Internet, 21 February 2001, available from http://www.aia.af.mil/common/homepages/pa/pahome/integrate.html.

[20] Ibid.

[21] Air Force Doctrine Document 2-5, *Information Operations*, September 1997, 1-3.

[22] Joint Publication 3-13, *Joint Doctrine for Information Operations*, 9 October 1998, x.

[23] Ibid, IV-1–IV-7.

[24] Ibid, vii-x. In the executive summary alone integration is discussed eight times stating that such integration is essential "to achieving a coherent strategy."

[25] Joint Publication 3-05, *Joint Doctrine for Special Operations*, 17 April 1998, II-2.

[26] "USSPACECOM Takes Charge of DoD Computer Network Attack," release number 15-00, 29 Sep 2000, n.p.; on-line, Internet, 15 Feb 01. http://www.spacecom.af.mil/usspace/rel15-00.htm.

[27] Col Carla D. Bass, "Building Castles on Sand – Underestimating the Tide of Information Operations," *Airpower Journal* 13, no. 2 (Summer 1999): 37.

[28] Ibid, 37-41.

[29] "US Joint Forces Mission Statement," 2 February 2001, n.p.; on-line, Internet, 21 February 2001, available from http://www.acom.mil.

Chapter 4

Conclusions

Improvements in doctrine, organization, and technology may lead to decisive outcomes resulting primarily from information operations.

—Joint Vision 2020

Just as the nature of airpower continues to be debated by military professionals, the impact of IO in future conflicts remains uncertain and is unlikely to be resolved in the near future. IO, much like airpower, can be seen either as a revolutionary advance or "simply another weapon that joins the arsenal along with the rifle, machine gun, tank, submarine, and radio."[1] The fact that a debate remains with respect to airpower does not bode well for a quick resolution of the organizational issues surrounding IO. Such a debate will most likely take years to resolve and, much like airpower, fail to satisfy everyone. However, this should not preclude the granting of greater autonomy to IO organizations. As the previous analysis supports, there are several reasons why such autonomy is warranted.

The information domain constitutes the newest warfighting domain. A separate and distinct domain, however, does not necessarily imply that the capabilities operating in such a domain require complete organizational independence. Instead other criteria must be met. On the question of decisiveness, joint doctrine recognizes that IO may be the "main effort, a support effort, or a phase of a JFC's campaign."[2] Such recognition indicates the belief that IO can potentially play a decisive role in the outcome of a conflict; however, to date the question of IO

decisiveness is largely speculation. Furthermore, organizational independence should guarantee more effective employment of a particular force. In the case of IO, there are no assurances that complete independence will result in more effective employment. However, IO can certainly benefit from increased organizational autonomy which will assist in fostering the type of "domain-mindedness" prevalent within the more traditional domains.

Increasing organizational autonomy is not without implications; therefore, decisions regarding IO organizations must be made with these implications in mind. First, allowing IO to continue to grow within the services should foster healthy interservice competition and innovation. Such development will also ensure the creation of IO capabilities uniquely suited to each service's core competencies. Second, IO doctrine and organizations will continue to influence one another. Much like airpower, organizational constructs are currently driving IO doctrine. Continuing to split IO capabilities among different unified commands will demand a change in joint doctrine because current doctrine calls for much closer IO integration than can be achieved in a multi-unified command scenario. Alternatively, the defense department can follow the spirit of current join IO doctrine by integrating all IO capabilities under a single unified command. Finally, bureaucratic realities will not disappear in the short term. Therefore, complete organizational independence is not fiscally feasible at this time. Rather a more balanced approach, similar to that taken with airpower during the interwar years, is more prudent at this time. In keeping with this balanced approach, greater objectivity with respect to IO is needed.

Just as Gen Mitchell became increasingly marginalized within the Army as his views became more extreme, IO is in danger of becoming similarly marginalized if its capabilities are oversold.[3] In addition, the repeated calls for major organizational changes, in the absence of

factual data supporting such changes, can actually stiffen the resolve of more skeptical decision-makers against greater IO autonomy. Instead a more moderate approach to IO is necessary. In this case, IO advocates can take the example of Major General Patrick, chief of the Air Service from 1921 to 1927. As one study of the period stated, "his [General Patrick's] moderation, judgment, and honesty were profoundly respected in the military organization and in Congress; he defended the Air Service against powerful opposition and secured substantial gains for it before his retirement."[4] Such moderation manifested in objective assessments of current IO capabilities can go far in gaining the respect of the decision-making hierarchy and help secure a measure of the organizational autonomy necessary for IO to mature.

In summary, organizational decisions regarding IO should be balanced between past historical examples of similar revolutionary periods and likely future technological progress. An understanding of the past and likely future offers the best opportunity to objectively determine the proper organizational structures for IO forces. This paper has focused on the past using airpower as a metaphor for IO. The analysis of airpower suggests that, at present, IO should continue to mature within the services in semi-autonomous organizations while a unified command takes on the responsibility of the entire IO arena. The assignment of IO to a single unified command is particularly important if the integration of the many unique IO capabilities is ever to be actualized. Taken in total, the approach suggested within this paper will reduce the risk associated with more radical suggestions and establish the necessary objectivity to ensure the most effective employment of IO in future conflicts.

Recommendations

This paper has focused on the likely effects of various organizational decisions on IO effectiveness and made preliminary organizational recommendations. The recommendations that

follow include a more thorough examination of service IO organizations, potential doctrinal revisions, and objective assessments of IO capabilities to help identify the likely impact of IO in future military operations.

Organizations

This paper has provided a framework to examine organizing forces within a domain of operations. The recommendations on organizations are only preliminary and must be weighed against other factors including accomplishment of service missions, distribution of functions and responsibilities among the existing unified commands, fiscal realities, and bureaucratic implications. An important future step is to examine the nature of the various IO service organizations. For example, the Air Force's much broader perspective on IO has resulted in more diverse AF IO organizations. A thorough examination of service IO organizations may assist in determining the proper skill-sets, training, and personnel necessary in IO organizations. Finally, such a study would capture better the benefits and limitations of each services's organizational structures as well as the functions better managed by a joint organization.

Doctrine

Secondly, there are two areas that need to be addressed within joint doctrine. First, doctrine should better describe the information domain and fundamental tenets or principles of IO. Other basic doctrine describes operations within a unique domain and makes a concerted effort to describe the basic tenets of applying force within the domain of operations.[5] This paper has laid the foundation for this in Appendix A. A more detailed description of the information domain and associated tenets will serve the dual purpose of properly bounding the domain as well as describing basic principles for IO employment. Second, joint doctrine should be congruent with major IO organizations. If IO integration remains an essential element of joint

doctrine, then joint organizations should reflect this principle. Conversely, if separate organizations are considered the most effective structures to employ IO, then joint doctrine should be rewritten to reflect this changed perception. This paper clearly favors the first option.

Assessing the future

Finally, as mentioned above, this paper has focused on the past; however, an objective assessment of the future potential of IO is also required. This assessment will provide a better understanding of the impact IO can be expected to have in deterrence and conflict and serve as a further basis for IO organizational decisions. Understanding the potential impact of IO will require a thorough understanding of enemy and friendly capabilities and vulnerabilities. In this instance, the words of Alexander Seversky may one day be prophetic for IO, "total war from the air against an undeveloped country or region is well nigh futile; it is one of the curious features of the most modern weapon that it is especially effective against the most modern types of civilization."[6] Determining the relevancy of Seversky's statement to IO remains an essential task and one that should be undertaken prior to making significant organizational decisions.

Notes

[1] Col Phillip S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell AFB, Ala.: Air University Press, 1997), xi.
[2] Joint Publication 3-13, *Joint Doctrine for Information Operations*, 9 October 1998, JP 3-13, II-1
[3] Lt Col Mark A. Clodfelter, "Molding Airpower Convictions: Development and Legacy of William Mitchell's Strategic Thinking," in *The Paths of Heaven: The Evolution of Airpower Theory*, ed. Col Phillip S. Meilinger (Maxwell AFB, Ala.: Air University Press, 1997),106-107.
[4] Thomas H. Greer, *The Development of Air Doctrine in the Army Air Arm: 1917-1941*. (1955; reprint, Washington, D.C.: The United States Air Force Special Studies Government Printing Office, 1985), 25.
[5] Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, September 1997, 11, 21-27.
[6] Major Alexander P. de Seversky, *Victory Through Air Power*, (New York, N.Y.: Simon & Schuster, 1942), 102.

Appendix A

Bounding the Information Domain

The objective of this appendix is to provide preliminary boundaries on the information domain. By its nature, the information domain is less tangible and more difficult to describe. Unfortunately, joint doctrine currently fails to adequately address the fundamental characteristics of the information domain. Doctrine written on other domains such as land and air provides more helpful descriptions of these domains. In these cases a variety of methods are used including descriptions of the physical characteristics of the domain, how the principles of war apply to operations within the domain, and tenets of employing forces within the domain.[1]

To facilitate the examination of the information domain, a framework for analysis is necessary. Rather than develop an entirely new methodology for analyzing the IO domain this appendix will adapt the methodologies used in two recent studies on air and space power. In the first of these studies, Major Bruce DeBlois performed an in-depth analysis of the differences between air and space power. His analysis focused on several characteristics of the domain, including physical and political characteristics of the domain and what he termed "realm-afforded capability."[2] Realm-afforded capability was focused on how the domains of air and space affected the capability to employ military power.[3] This latter analysis can be particularly insightful because it helps clarify the key characteristics of military capabilities operating within a specific domain.

The second study used a combination of Air Force and Army doctrine descriptions of air and land operations. This study focused on three key areas: features of the medium, characteristics of the forces operating in the medium, and tenets of force employment.[4] The features of the medium described how the characteristics of the medium itself were likely to affect forces operating within the medium. "Characteristics of forces" described the fundamental attributes of forces within the medium in question.[5] Finally, "tenets of force employment" provided the fundamental principles for how to employ military forces within the domain.[6]

An admixture of the two studies will guide the following analysis of the information domain. Specifically, the analysis will examine the physical characteristics of the medium, the likely targets within the domain, and the characteristics of forces operating in the medium. This analysis will not examine tenets for force employment because IO is still in the early stages of development. Thus these tenets are speculative in nature at this time. Certainly, as IO matures such tenets should be used to better define the domain. The addition of likely targets is included because such targets are fundamentally different from those associated with traditional military operations and thus help further bound the domain.

Before examining the information domain in more detail an important qualifier is required. Defining boundaries that apply to all IO capabilities is extremely difficult. Officially, IO contains many disparate capabilities creating a large span of activity falling under the IO rubric.[7] As one detailed study of strategic information warfare noted, such breadth "inhibits the creation of boundaries which helps guide detailed analysis." To deal with this breadth, the boundaries that follow will focus more on distinguishing one or more IO capabilities from other forms of warfare rather than defining characteristics applicable to all IO capabilities. The intent of the analysis is to define boundaries that are qualitatively different from the domains of land, sea, air,

and land. As will be seen there will be exceptions to almost every boundary and no single boundary is enough to adequately define the information domain. However, taken holistically the boundaries do provide separation of the information domain from other operating domains.

Physical Environment

Several of the capabilities falling under the IO umbrella rely extensively on the electromagnetic (EM) spectrum as a medium of attack although various capabilities may utilize the traditional domains of land, sea, air, and space. For example, EW is primarily concerned with attacking and defending the use of the EM spectrum. Other capabilities such as computer network attack may use data manipulation to facilitate an attack. However, both capabilities use the EM spectrum as a medium to conduct and defend against attacks.[8] Finally, information, which is often the target of an attack, relies extensively on the spectrum for collection, processing, storage, and transmission.[9] This discussion is not meant to suggest that all IO capabilities rely exclusively on the EM spectrum. Other capabilities such as PSYOP or deception may use the traditional mediums for employment.[10] However what distinguishes IO from other military operations is that no other form of force application relies on the EM spectrum to the degree of IO.

Targets

As joint doctrine states, "IO target information or information systems in order to affect the information-based process."[11] *Joint Vision 2020* extends the classification of targets suggesting, "the ultimate target of information operations is the human decision maker."[12] This provides two important classifications of IO targets—information- and cognitive-based. By directly affecting the information-based targets, IO can then indirectly influence the ultimate cognitive-based targets—decision-makers. The classification of IO targets makes them fundamentally different

from those in other domains, which have traditionally focused on fielded forces, equipment, and the war-making machinery of a country.

To impact the human decision-maker, information must first be affected. The capabilities within IO represent the methods used to affect information. The objective then becomes manipulation of information in some fashion (disrupt, deny, degrade, destroy) to achieve a desired effect (influence decision-makers). The attempt to meet desired objectives without directly engaging or destroying enemy forces is a significant break from traditional military theory and doctrine. This distinction creates an important boundary for the information domain. As the next section will illustrate, there are other characteristics that are unique to the information domain as well.

Operational Characteristics

Finally, the various IO capabilities have defining characteristics including non-lethality, non-kinetic applications, speed of attack, stand-off capability, and the ability to conduct massively parallel operations. Many of these same characteristics can be used to describe aspects of land, sea, or air power. However, the difference is one of degree. For example, while applications of airpower can attack with significant speed, IO attacks may be orders of magnitude faster.

IO capabilities are distinguished from other force capabilities because they offer the unique opportunity to achieve objectives "while minimizing potentially devastating social, economic, and political effects normally associated with conventional military operations."[13] In fact, this is one of IO's most compelling promises—winning wars without firing a shot.[14] Whether such optimism is warranted remains debated; however, all of the offensive IO capabilities can be executed without inflicting direct casualties, with the possible exception of

physical attack.[15] However, as a recent examination of computer network attack noted, the ability to avoid physical destruction is tightly coupled with the target of such operations.[16]

The concept of non-lethality is closely related to the non-kinetic aspects of IO. Most IO capabilities can affect a target without necessarily altering the physical properties of the target being attacked, with physical attack again being the exception.[17] This ability is a fundamental shift from how wars have traditionally been fought which focused on the physical destruction of enemy forces and capability. IO alters this equation by focusing more on achieving desired effects through the attack of information- and cognitive-based processes. The speed with which such attacks can occur is another distinct characteristic of IO.

IO attacks can occur nearly at the speed of light depending upon the capability chosen to prosecute the attack. Attacks relying on the EM spectrum are governed primarily by the physical properties of the conducting medium (e.g., air, fiber optics, etc.). These constraints impose minimal delays on IO attacks. However, not all IO capabilities can be applied at this speed. For example, deception operations could range from the manipulation of adversary data stores (taking seconds or less to achieve) to long-term strategic deception operations (taking days or weeks to effectively conclude). The speed inherent in IO is important because it potentially allows for massively parallel operations in near real-time from long-range—the next important operational characteristic.

Adding to IO's capability to operate with speed is the ability to apply force from remote distances (i.e., outside a theater of operations) for sustained periods of time against a wide variety of targets. Certainly, the creation of stand-off weapons for the traditional forces has reduced the exposure of friendly forces. However, with the possible exception of long-range missiles, the application of force presently requires the presence of platforms within a theater of

operations.   IO breaks this paradigm by allowing operations to be conducted remotely and completely outside the physical battlespace.[18]

Likewise, such operations can be automated and targeted against a variety of information systems allowing for rapid, massively parallel operations.   Although parallel operations is a guiding principle within airpower doctrine, airpower can not achieve the magnitude of operations due to the physical limitations such as sortie rates, weapons systems in theater, etc.[19] Again, not all IO capabilities possess such attributes. PYSOP may depend on the distribution of pamphlets directly to adversary forces.   Such an application obviously depends upon close proximity to enemy forces; however, other IO capabilities, particularly information attack, will have the ability to engage from remote distances requiring only network access for execution.

The table below summarizes the characteristics of the information domain.   First, the primary operating environment for much of IO remains the EM spectrum.   Other operating environments may be used to obtain IO effects, but such environments are less integral to the nature of IO. Secondly, IO targets differ significantly from the targets of conventional weapons. Within IO information and information processes are often the targets of operations. In addition, the mind of the adversary may be an equally compelling target with desired effects ranging from deception to will (psychological). Finally, there is a number of defining characteristics within the IO domain including the speed with which attacks can occur via massively parallel operations for sustained periods of time.

Table 2: Bounding the Information Domain

Physical Environment	IO Targets	Characteristics of IO
electromagnetic spectrum	information and information processes	non-lethality
	cognitive processes	non-kinetic applications
		speed of attack
		stand-off capability
		sustained, massively parallel operations

The analysis above illustrates that the information domain is unique and focused on three dimensions—the physical environment, targets, and characteristics. There are likely additional dimensions that can delineate further the information domain from air, space, land, and sea domains. Furthermore, the characteristics of IO within this appendix are not meant to be complete or exhaustive and there may be others that more aptly describe the domain. Importantly, bounding the information domain should not be just an academic exercise. Rather, the delineation and understanding of the information domain should be a guiding factor in decisions regarding the organization and employment of IO forces.

Notes

[1] Air Force Doctrine Document 1, *Air Force Basic Doctrine*, September 1997, 11-27. Field Manual 100-5, *Operations*, June 1993, 2-4-2-15, 14-3-14-5.

[2] DuBlois, 564. Maj Dublois analysis also differentiated airpower and space power with non-physical characteristics including political, employment and development considerations. While these are certainly valid considerations they were not considered to be as central to the analysis of information as the physical characteristics.

[3] Dublois, 556.

[4] Major Alan M. Robinson, "Distinguishing Space Power From Air Power: Implications For The Space Force Debate," Research Report no. 98-239 (Maxwell AFB, Ala.: Air Command and Staff College, April 1998), 23-29; on-line. Internet, 28 Jan 2000, available from http://www.maxwell.af.mil/au/database/ research/ay1998/acsc/98-239.pdfRobinson.

Notes

[5] Ibid, 13-14. Missing from this discussion are the political and legal factors affecting force employment. While there are political and legal factors with regards to IO, the IO political and legal landscape is far less defined making comparisons difficult at this time.

[6] Ibid, 14.

[7] Joint Publication (JP) 3-13, *Joint Doctrine for Information Operations*, 9 October 1998, I-10.

[8] Joint Publication 3-51, *Joint Doctrine for Electronic Warfare*, 7 April 2000, GL-5. The discussion on CNA and EW provides an excellent description of this subtle difference.

[9] Ibid, I-4.

[10] For example, PSYOP activities may rely on the Commando Solo airframe to conduct an operation. In such a situation, IO would rely more extensively on the air medium for the conduct of operations.

[11] JP 3-13, I-11.

[12] *Joint Vision 2020 - America's Military: Preparing for Tomorrow*, US Government Printing Office, Washington, D.C., June 2000, 29.

[13] JP 3-13, II-10.

[14] Alvin and Heidi Toffler, *War and Anti-war*, (Boston, Mass.: Little, Brown & Company, 1993), 128.

[15] Lt Col William J. Bayles, "Moral and Ethical Considerations for Computer Network Attack as a Means of National Power in Time of War," *Chairman of the Joint Chiefs of Staff Strategy Essay Competition – Essays 2000*, November 2000, 26. The author notes that second order effects of information attacks if directed at certain targets may result in substantial casualties. While this paper does not discount this possibility, the focus of the discussion is on precision attacks such as Lt Col Bayles outlines in p. 23-24.

[16] Ibid, 20-26.

[17] Air Force Doctrine Document 2-5, *Information Operations*, September 1997, 15. The definition of information attack in this document provides a good discussion of this capability to achieve results without distorting the physical properties of the target. In addition, at the most fundamental level (data storage, human perceptions) physical changes do occur; however, the ability of the targeted system (again information- or cognitive-based) to continue to function remains.

[18] JP 3-13, II-9.

[19] Air Force Doctrine Document 2, *Organization and Employment of Aerospace Power*, 17 February 2000, 7. This document describes how airpower is employed to greatest effect by pursuing "parallel, asymmetric operations." The difference in the case of IO is the ability to automate attacks and not be tied to sortie rates, platforms in the theater, etc.

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